WHAT I CLAIM IS:

1. A planar magnetic field gradient source structure, comprising:

a plurality of magnetic laminae having a longitudinal length, L, are layered into a magnetic stack, said longitudinal length, L, being greater than a stack thickness, t;

said magnetic stack having a top outer lamina surface, a bottom outer lamina surface and a stack center;

each of said plurality of magnetic laminae having a magnetic charge distribution, a perpendicular magnetic orientation and a variable magnetic strength, M(r);

said magnetic stack being configured to cancel unpaired negative surface charges from said top outer lamina surface and said bottom outer lamina surface;

said variable magnetic strength, M(r), varies linearly with a normal distance, r, from said stack center; and

said perpendicular magnetic orientation and said variable magnetic strength, M(r), generating a uniform volume magnetic charge density, ρ, for said magnetic stack, a magnetic field, M, perpendicular to said magnetic stack, a maximum stack magnetization, M(t), and a magnetic gradient with a linear dependence of magnetic field.

2. The planar magnetic field gradient source structure, as recited in claim 1, further comprising said uniform volume magnetic charge density, ρ, varies abruptly from a one of said plurality of magnetic laminae to another one of said plurality of magnetic laminae.

3. The planar magnetic field gradient source structure, as recited in claim 2, further comprising said top lamina surface and said bottom lamina surface acting in opposition to each other with an equal strength that mutually cancels unpaired negative charges generated by said top lamina surface and said bottom lamina surface.

4. The planar magnetic field gradient source structure, as recited in claim 3, further comprising said variable magnetic strength, M(r), being calculated according to the equation:

$$M(r) = \frac{M(t)}{t} r$$

where said M(t) is a magnetization of said magnetic stack at said stack thickness t.

5. The planar magnetic field gradient source structure, as recited in claim 4, further comprising said uniform volume magnetic charge density, ρ, being calculated according to the equation:

$$\rho = -\frac{M(t)}{t} \quad .$$

6. The planar magnetic field gradient source structure, as recited in claim 5, further comprising a tunnel through said structure as a working space.

7. The planar magnetic field gradient source structure, as recited in claim 6, further comprising said plurality of magnetic laminae being disks.

8. The planar magnetic field gradient source structure, as recited in claim 7, further comprising said perpendicular magnetic orientation being perpendicular to said stack center.

9. The planar magnetic field gradient source structure, as recited in claim 8, further comprising an opposite direction magnetization opposite said magnetic gradient having a magnetic field given by the equation:

$$H = \pm\left[B_r^{(t)} - \frac{B_r^{(t)}}{t} r \right] \quad .$$

10. A cylindrical magnetic field gradient source structure, comprising:

a plurality of nested cylindrical magnetic laminae being layered in a magnetic cylinder;

said magnetic cylinder having an outer surface, a pair of opposing poles, a radial dimension, t, and a center;

each of said plurality of nested cylindrical magnetic laminae being thinner than a cylindrical radius and having a magnetic charge distribution, a perpendicular magnetic orientation and a variable magnetic strength, M(r);

said magnetic cylinder being configured to cancel unpaired negative surface charges from said outer surface;

said variable magnetic strength, M(r), varies linearly with a normal distance, r, from said center; and

said perpendicular magnetic orientation and said variable magnetic strength, M(r), generating a uniform volume magnetic charge density, ρ, for said magnetic cylinder, a magnetic field, M, perpendicular to said magnetic cylinder, a maximum cylindrical magnetization, M(t), and a magnetic gradient with a linear dependence of magnetic field.

11. The cylindrical magnetic field gradient source structure, as recited in claim 10, further comprising said uniform volume magnetic charge density, ρ, varies abruptly from a one of nested cylindrical magnetic laminae to another one of said plurality of nested cylindrical magnetic laminae.

12. The cylindrical magnetic field gradient source structure, as recited in claim 11, further comprising said variable magnetic strength, M(r), being calculated according to the equation:

$$M(r) = \frac{M(t)}{t} r$$

where said M(t) is a magnetization for said magnetic cylinder.

13. The cylindrical magnetic field gradient source structure, as recited in claim 12, further comprising said uniform volume magnetic charge density, ρ, being calculated according to the equation:

$$\rho = -\frac{M(t)}{t} \quad .$$

14. The cylindrical magnetic field gradient source structure, as recited in claim 13, further comprising positioning a tunnel into said structure as a working space.

15. The cylindrical magnetic field gradient source structure, as recited in claim 14, further comprising positioning said tunnel through said structure.

16. The cylindrical magnetic field gradient source structure, as recited in claim 15, further comprising positioning said tunnel to intersect said center.

17. The cylindrical magnetic field gradient source structure, as recited in claim 16, further comprising said perpendicular magnetic orientation being perpendicular to each of the plurality of nested cylindrical magnetic laminae.

18. The cylindrical magnetic field gradient source structure, as recited in claim 17, further comprising an opposite direction magnetization opposite said magnetic gradient having a magnetic field given by the equation:

$$H = \pm\left[B_r^{(t)} - \frac{B_r^{(t)}}{t} r\right] \quad .$$

19. A spherical magnetic field gradient source structure, comprising:

a plurality of nested concentric magnetic laminae are arranged in a layered magnetic sphere;

said layered magnetic sphere having an outer surface, a pair of opposing poles, a radial dimension, t, and a center;

each of said plurality of nested concentric magnetic laminae being thinner than a spherical radius and having a magnetic charge distribution, a perpendicular magnetic orientation and a variable magnetic strength, M(r);

said layered magnetic sphere being configured to cancel unpaired negative surface charges from said outer surface;

said variable magnetic strength, M(r), varies linearly with a normal distance, r, from said center; and

said perpendicular magnetic orientation and said variable magnetic strength, M(r), generating a uniform volume magnetic charge density, ρ, for said layered magnetic sphere, a magnetic field, M, perpendicular to said layered magnetic sphere, a maximum spherical magnetization, M(t), and a magnetic gradient with a linear dependence of magnetic field.

20. The spherical magnetic field gradient source structure, as recited in claim 21, further comprising said uniform volume magnetic charge density, ρ, varying abruptly from a one of said plurality of nested concentric magnetic laminae to another one of said plurality of nested concentric magnetic laminae.

21. The spherical magnetic field gradient source structure, as recited in claim 20, further comprising said variable magnetic strength, M(r), being calculated according to the equation:

$$M(r) = \frac{M(t)}{t} r$$

where said M(t) is a magnetization for said layered magnetic sphere.

22. The spherical magnetic field gradient source structure, as recited in claim 21, further comprising said uniform volume magnetic charge density, ρ, being calculated according to the equation:

$$\rho = -\frac{M(t)}{t} \quad .$$

23. The spherical magnetic field gradient source structure, as recited in claim 22, further comprising said plurality of nested concentric magnetic laminae being magnetic shells.

24. The spherical magnetic field gradient source structure, as recited in claim 23, further comprising positioning a tunnel into said structure as a working space.

25. The spherical magnetic field gradient source structure, as recited in claim 24, further comprising positioning said tunnel through said structure.

26. The spherical magnetic field gradient source structure, as recited in claim 25, further comprising positioning said tunnel to intersect said center.

27. The spherical magnetic field gradient source structure, as recited in claim 26, further comprising said perpendicular magnetic orientation being perpendicular to said radial dimension, t.

28. The spherical magnetic field gradient source structure, as recited in claim 27, further comprising an opposite direction magnetization opposite said magnetic gradient having a magnetic field given by the equation:

$$H = \pm\left[B_r^{(t)} - \frac{B_r^{(t)}}{t}r\right] \quad .$$

29. A planar spherical magnetic field gradient source structure, comprising:

a plurality of planar magnetic laminae are stacked in a layered magnetic sphere;

said planar layered magnetic sphere having an outer surface, a pair of opposing poles, a radial dimension, t, and a center;

each of said plurality of planar magnetic laminae being thinner than a spherical radius and having a magnetic charge distribution, a perpendicular magnetic orientation and a variable magnetic strength, M(r);

said planar layered magnetic sphere being configured to cancel unpaired negative surface charges from said outer surface;

said variable magnetic strength, M(r), varies linearly with a normal distance, r, from said center; and

said perpendicular magnetic orientation and said variable magnetic strength, M(r), generating a uniform volume magnetic charge density, ρ, for said planar layered magnetic sphere, a magnetic field, M, perpendicular to said planar layered magnetic sphere, a maximum spherical magnetization, M(t), and a magnetic gradient with a linear dependence of magnetic field.

30. The planar spherical magnetic field gradient source structure, as recited in claim 29, further comprising said uniform volume magnetic charge density, ρ, varying abruptly from a one of said plurality of planar magnetic laminae to another one of said plurality of plurality of planar magnetic laminae.

31. The planar spherical magnetic field gradient source structure, as recited in claim 30, further comprising said variable magnetic strength, M(r), being calculated according to the equation:

$$M(r) = \frac{M(t)}{t} r$$

where said M(t) is a magnetization for said planar layered magnetic sphere.

32. The planar spherical magnetic field gradient source structure, as recited in claim 31, further comprising said uniform volume magnetic charge density, ρ, being calculated according to the equation:

$$\rho = -\frac{M(t)}{t} \quad .$$

33. The planar spherical magnetic field gradient source structure, as recited in claim 32, further comprising positioning a tunnel into said structure as a working space.

34. The planar spherical magnetic field gradient source structure, as recited in claim 33, further comprising positioning said tunnel through said structure.

35. The planar spherical magnetic field gradient source structure, as recited in claim 34, further comprising positioning said tunnel to intersect said center.

36. The planar spherical magnetic field gradient source structure, as recited in claim 35, further comprising

37. The planar spherical magnetic field gradient source structure, as recited in claim 36, further comprising said perpendicular magnetic orientation being perpendicular to said plurality of planar magnetic laminae.

38. The planar spherical magnetic field gradient source structure, as recited in claim 37, further comprising an opposite direction magnetization opposite said magnetic gradient having a magnetic field given by the equation:

$$H = \pm\left[B_r^{(i)} - \frac{B_r^{(i)}}{t} r\right] .$$

39. The planar spherical magnetic field gradient source structure, as recited in claim 38, further comprising said plurality of planar magnetic laminae being disks.

40. The spherical planar magnetic field gradient source structure, as recited in claim 32, further comprising each of said plurality of planar magnetic laminae having a slot.

41. The spherical planar magnetic field gradient source structure, as recited in claim 40, further comprising said plurality of planar magnetic laminae being aligned to form a meridonial slot.

42. The planar spherical magnetic field gradient source structure, as recited in claim 41, further comprising positioning meridonial slot into said structure as a working space.

43. The spherical planar magnetic field gradient source structure, as recited in claim 42, further comprising positioning said meridonial slot perpendicular to said plurality of planar magnetic laminae.

44. A method of generating a magnetic field gradient, comprising the steps of:

forming a plurality of magnetic laminae having a longitudinal length, L;

layering said plurality of magnetic laminae into a magnetic stack; '

forming said magnetic stack having a top outer lamina surface, a bottom outer lamina surface and a stack center;

dimensioning a stack thickness, t, to be less than said longitudinal length, L;

providing each of said plurality of magnetic laminae with a magnetic charge distribution, a perpendicular magnetic orientation and a variable magnetic strength, M(r);

configuring said magnetic stack to cancel unpaired negative surface charges from said top outer lamina surface and said bottom outer lamina surface;

forming a planar magnetic field gradient source;

allowing said variable magnetic strength, M(r), to vary linearly with a normal distance, r, from said stack center; and

causing said perpendicular magnetic orientation and said variable magnetic strength, M(r), to generate a uniform volume magnetic charge density, ρ, for said magnetic stack, a

magnetic field, M, perpendicular to said magnetic stack, a maximum stack magnetization, M(t), and a magnetic gradient with a linear dependence of magnetic field.

45. The method of generating a magnetic field gradient, as recited in claim 44, further comprising the step of calculating said variable magnetic strength, M(r), according to the equation:

$$M(r) = \frac{M(t)}{t} r$$

where said M(t) is a magnetization of said magnetic stack at said stack thickness t.

46. The method of generating a magnetic field gradient, as recited in claim 45, further comprising the step of calculating said uniform volume magnetic charge density, ρ, according to the equation:

$$\rho = -\frac{M(t)}{t} \quad .$$

47. The method of generating a magnetic field gradient, as recited in claim 46, further comprising the step of positioning a tunnel through said source as a working space.

48. The method of generating a magnetic field gradient, as recited in claim 47, further comprising the step of forming said plurality of magnetic laminae from disks.

49. A method of generating a magnetic field gradient, comprising the steps of:

forming a plurality of nested cylindrical magnetic laminae;

layering said plurality of nested cylindrical magnetic laminae into a magnetic cylinder;

providing said magnetic cylinder having an outer surface, a pair of opposing poles, a radial dimension, t, and a center;

forming each of said plurality of nested cylindrical magnetic laminae thinner than a cylindrical radius and having a magnetic charge distribution, a perpendicular magnetic orientation and a variable magnetic strength, M(r);

configuring said magnetic cylinder to cancel unpaired negative surface charges from said outer surface;

forming a cylindrical magnetic field magnetic field gradient source;

allowing said variable magnetic strength, M(r), to vary linearly with a normal distance, r, from said center; and

causing said perpendicular magnetic orientation and said variable magnetic strength, M(r), to generate a uniform volume magnetic charge density, ρ, for said magnetic cylinder, a magnetic field, M, perpendicular to said magnetic cylinder, a maximum cylindrical magnetization, M(t), and a magnetic gradient with a linear dependence of magnetic field.

50. The method of generating a magnetic field gradient, as recited in claim 49, further comprising the step of calculating said variable magnetic strength, M(r), according to the equation:

$$M(r) = \frac{M(t)}{t} r$$

where said M(t) is a magnetization for said magnetic cylinder.

51. The method of generating a magnetic field gradient, as recited in claim 50, further comprising the step of calculating said uniform volume magnetic charge density, ρ, according to the equation:

$$\rho = -\frac{M(t)}{t} \quad .$$

52. The method of generating a magnetic field gradient, as recited in claim 51, further comprising the step of positioning a tunnel through said source as a working space.

53. A method of generating a magnetic field gradient, comprising the steps of:

forming a plurality of nested concentric magnetic laminae;

layering said plurality of nested concentric magnetic laminae into a layered magnetic sphere;

providing said layered magnetic sphere with an outer surface, a pair of opposing poles, a radial dimension, t, and a center;

forming each of said plurality of nested concentric magnetic laminae thinner than a spherical radius and having a magnetic charge distribution, a perpendicular magnetic orientation and a variable magnetic strength, M(r);

configuring said layered magnetic sphere to cancel unpaired negative surface charges from said outer surface;

forming a spherical magnetic field magnetic field gradient source;

allowing said variable magnetic strength, M(r), varies linearly with a normal distance, r, from said center; and

causing said perpendicular magnetic orientation and said variable magnetic strength, M(r), to generate a uniform volume magnetic charge density, ρ, for said layered magnetic sphere, a magnetic field, M, perpendicular to said layered magnetic sphere, a maximum spherical magnetization, M(t), and a magnetic gradient with a linear dependence of magnetic field.

54. The method of generating a magnetic field gradient, as recited in claim 53, further comprising the step of calculating said variable magnetic strength, M(r), according to the equation:

$$M(r) = \frac{M(t)}{t} r$$

where said M(t) is a magnetization for said layered magnetic sphere.

55. The method of generating a magnetic field gradient, as recited in claim 54, further comprising the step of calculating said uniform volume magnetic charge density, ρ, according to the equation:

$$\rho = -\frac{M(t)}{t} \quad .$$

56. The method of generating a magnetic field gradient, as recited in claim 55, further comprising the step of positioning a tunnel through said source as a working space.